

REMARKS

This Amendment and Response is submitted in reply to the Office Action mailed August 14, 2003. Claims 1-76 were pending. Reexamination and reconsideration is respectfully requested.

Claim 55 was rejected under 35 U.S.C. §112(2) as being indefinite. Appropriate antecedent has been added.

Claims 1 has been amended to include the concept of longitudinal oriented reinforcing fibers, as generally recited in claim 40. Similar amendments were also made to claims 50, 54, 55, 56 and 60.

The claimed invention is directed to a reinforcing structure for a pultruded part in which a portion of the reinforcing fibers are oriented transversely to the longitudinal reinforcing fibers or rovings. Pultrusion is a continuous, dynamic process in which longitudinal rovings and resin are pulled through a forming dye. In most applications, the resulting part has a uniform cross-section similar to an extruded part. The dynamic nature of the pultrusion process makes it extremely difficult to orient reinforcing fibers transverse to the longitudinal rovings. The transverse reinforcing fibers are held together by a transport web of staple fibers. It is the combination of the longitudinal oriented reinforcing fibers or rovings, the transversely oriented reinforcing fibers, and the permeable transport web that give the resulting pultruded part its strength.

Claims 1-9, 13-15, 26-27, 30-31, 37, 54, 59-62, 64-65, 67-68, 72 and 74 were rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 5,286,553 (Haraguchi). Haraguchi is directed to a reinforcing material for a molded article. (Haraguchi, column 2, line 2; column 2, line 10; column 3, lines 27-30; and column 4, lines 26-33). The reinforcing structure of Haraguchi is "a web in which bundles of reinforcing filaments are gathered and uni-directionally paralleled, a woven sheet such as a plain weave or satin weave sheet, and a knitted sheet." (Haraguchi, column 4, lines 22-26). Molding is a substantially static process, in which the reinforcing structure is typically positioned in a mold and resin is then injected. Haraguchi is completely devoid of any reference to longitudinal rovings or the demands of the pultrusion process on reinforcing materials.

Haraguchi fails to teach or suggested the combination of a plurality of longitudinal rovings oriented along the longitudinal axis, transversely oriented reinforcing fibers, and the permeable transport web securing the transverse reinforcing fibers. Haraguchi also contains no teaching or disclosure that his reinforcing material is suitable for use in a pultruded article. In fact, Haraguchi makes no mention of pultrusion whatsoever. Even if the reinforcing material of Haraguchi was suitable for use in pultrusion, the rejection still fails because there is no teaching or suggestion in Haraguchi to orienting the uni-directionally parallel bundle of filaments transversely to longitudinal rovings. Applicants respectfully submit that no prima facie case of obviousness is set forth.

Claims 22-25, 28-29, 50-53, 56 and 66 were rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 5,286,553 (Haraguchi), or in the alternative, under 35 U.S.C. §103(a) as obvious over Haraguchi.

For the reasons discussed above, Haraguchi fails to teach or suggested the combination of a plurality of longitudinal rovings oriented along the longitudinal axis, transversely oriented reinforcing fibers, and the permeable transport web securing the transverse reinforcing fibers. Haraguchi also contains no teaching or disclosure that his reinforcing material is suitable for use in a pultruded article or to orienting the uni-directionally parallel bundle of filaments transversely to longitudinal rovings.

With regard to the definiteness of the rejected claims, Applicants respectfully submit it is impermissible to ignore the advantages, properties, utilities, and unexpected results flowing from the claimed invention since they are part of the invention as a whole. In re Chupp, 816 F.2d 643, 2 USPQ2d 1437 (Fed. Cir. 1987). The physical properties of the claimed structures are affirmative limitations that must be given patentable weight when reviewing patentability. Applicants respectfully submit that no prima facie case of obviousness is set forth.

Claims 11-12 and 55 were rejected under 35 U.S.C. §103 as being unpatentable over Haraguchi in view of U.S. 6,080,482 (Martin). As discussed above, Haraguchi fails to teach or suggested the combination of a plurality of longitudinal rovings oriented along the longitudinal axis, transversely oriented reinforcing fibers, and the

permeable transport web securing the transverse reinforcing fibers. Haraguchi also contains no teaching or disclosure that his reinforcing material is suitable for use in a pultruded article or to orient the uni-directionally parallel bundle of filaments transversely to longitudinal rovings. Martin is equally silent on the use of its filaments in a pultrusion process. Consequently, there is no teaching or suggestion for the proposed modification of Haraguchi in view of Martin. Applicants submit that no prima-facie case of obviousness is set forth.

Claims 18-19 and 63 were rejected under 35 U.S.C. § 103 as being unpatentable over Haraguchi in view of U.S. 4,278,720 (Shannon). As discussed above, Haraguchi fails to teach or suggested the combination of a plurality of longitudinal rovings oriented along the longitudinal axis, transversely oriented reinforcing fibers, and the permeable transport web securing the transverse reinforcing fibers. Haraguchi also contains no teaching or disclosure that his reinforcing material is suitable for use in a pultruded article or to orienting the uni-directionally parallel bundle of filaments transversely to longitudinal rovings. Applicants submit that no prima-facie case of obviousness is set forth.

Claims 16-17, 34-36, 38-49, 57-58, 69-71 and 73 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Haraguchi in view of U.S. 5,055,242 (Vane). Vane discloses a reinforcing material having a plurality of superimposed layers of unidirectional non-woven yarns or threads laid side-by-side. The yarns in at least some of the different layers extend in different directions. The layers of reinforcing material are stitched together by knitting so as to secure the yarns in fixed positions relative to one another.

Claim 1 does not recite stitching. In light of the allowability of claim 1 as discussed above, Applicants submit that claims 16-17, 34-36, 38-49 distinguish over the cited references. Secondly, there is no teaching or disclosure in Haraguchi for the proposed modification. In fact, Haraguchi teaches away from woven structures:

“It is considered that the reason why the UD [unidirectionally paralleled] web is superior to the woven sheet is probably as follows.

In the woven sheet, yarns bend at crossing points of warps and wefts, and since reinforcing filament bundles are tightened by these bends, when the woven sheet is formed into a composite, reinforcing filaments are not uniformly dispersed in the composite and concentration of the stress occurs, and thus, the mechanical

properties become poor. Moreover, since the boundary between the warps and wefts is definite, when the woven sheet is formed into a composite, thermoplastic polymer-rich portions extending in the direction of the reinforcing filaments are formed, and the strength is low in the direction orthogonal to the reinforcing filaments in the composite.” (Haraguchi, col. 4, lines 43-56)(Emphasis added).

Applicants respectfully submit that woven sheets are analogous to stitched sheets and that the problems identified in Haraguchi apply to both.

Independent claims 57 and 58 recite first and second reinforcing fibers oriented at $\pm 45^\circ$ or $\pm 60^\circ$ relative to the pull direction, respectively, and to staple fibers attached to the first and second reinforcing fibers. Haraguchi discloses uni-directionally paralleled bundles of reinforcing filaments. (Haraguchi, column 4, lines 22-26). There is no teaching or disclosure in Haraguchi for the claimed configuration of reinforcing fibers. Additionally, claims 57 and 58 do not rely on stitching to secure the first and second reinforcing fibers. Therefore, Applicants submit that no prima facie case of obviousness is set forth.

Claims 20-25, 32-33 and 75-76 were rejected under 35 U.S.C. §103(a) as being unpatentable over Haraguchi in view of Beer et al. (U.S. 5,910,458). Applicants respectfully submit that in light of the allowability of claim 1 is discussed above, claims 20-25 and 32-33 distinguish over the cited references. In light of the allowability of claim 61 is discussed above, claims 75 and 76 distinguish over the cited references.

For the rejection to succeed, some teaching or disclosure must be found in the primary reference, Haraguchi, for the proposed modification. See *Amgen, Inc. v. Chugai Pharmaceutical Co., Ltd.*, 927 F.2d 1200, 18 USPQ2d 1016 (Fed. Cir. 1991). The needling of Beer can damage, and frequently cuts, the reinforcing fiber. Needling would also likely break up the bundles of uni-directional filaments so prized by Haraguchi. Applicants respectfully submit that Haraguchi teaches away from using needling of Beer and that there is no motivation for their proposed modification of Haraguchi with Beer. Applicants submit that claims 20-25, 32-33 and 75-76 distinguish over the cited references and are in condition for allowance.

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Conclusion

All pending claims are now in condition for allowance. A notice to that effect is respectfully requested.

Respectfully Submitted,

LAURENCE W. DAVIES et al.

By: 

Karl G. Schwappach, #35,786
FAEGRE & BENSON LLP
2200 Wells Fargo Center
90 South Seventh Street
Minneapolis, MN 55402-3901
612/766-7773

Dated: December 12, 2003

M2:20588895.01

Serial No.: 10/015,106